NON-PUBLIC?: N
ACCESSION #: 8807290132
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Vermont Yankee Nuclear Power Station PAGE: 1 of 3

DOCKET NUMBER: 05000271

TITLE: Unanticipated Scram Due to Malfunction of Turbine Vibration Probe
EVENT DATE: 06/24/88 LER #: 88-008-00 REPORT DATE: 07/19/88

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: James P. Pelletier, Plant Manager TELEPHONE #: 802-257-7711

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: TA COMPONENT: VT MANUFACTURER: G080
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On 6/24/88 at 1546, with the Reactor at 100% power, the Main Turbine (TA) tripped which resulted in a Reactor SCRAM and Primary Containment Isolation System (PCIS) (JM) trip (Groups 2, 3 and 5). The turbine trip resulted from an erroneous high vibration signal from the No. 10 Turbine Bearing Vibration Probe (EIIS=VT). Vibration at the turbine bearings is monitored by the Turbine Supervisory Instrument System (JJ) which utilizes vibration probes located at each bearing. This system also sends a trip signal to the Main Trip Solenoid (MTS #1) when excessive vibration is sensed on any of the monitored bearings. The Main Trip Solenoid, in turn, causes the Turbine Stop and Control Valves to close and a Reactor SCRAM signal to be generated with a subsequent SCRAM of the Reactor.

The Reactor SCRAM along with the fast closure of the turbine valves caused the Reactor water level to shrink to the low water level trip point which subsequently caused the trip of the Containment Isolation System valves.

On 6/24/88 at 1550, the SCRAM and isolations were reset.

The immediate cause of the turbine trip is attributed to a failure of the vibration probe coil in the No. 10 turbine bearing.

The exact root cause of the coil failure could not be readily determined but is suspected to be aging.

The probe was subsequently replaced by the Instrument and Control Department on 6/29/88 and the system placed back in service.

(End of Abstract)

DESCRIPTION OF EVENTS

On 6/24/88 at 1546, while operating at 100% steady state power, a turbine trip occurred due to a malfunction of the No. 10 Turbine Bearing Vibration Probe (EIIS=VT). The probe (Manufacturer GE, Cat #5470364G43) senses vibration at the bearing by moving a metallic core through a coil which generates a signal in proportion to the amplitude of the vibration. The coil in the No. 10 bearing probe developed an intermittent open and short circuit, the short resulted in a false high vibration signal being sent to the Turbine Supervisory Instrument System (JJ) which in turn tripped the Main Trip Solenoid (MTS #1). MTS #1 tripped the turbine by dumping control oil from the Turbine Stop and Control Valves Operators. Limit switches on the Turbine Stop Valves sent a SCRAM signal to the Reactor Protection System (JE) when the stop valves reached 90% of their full open position thus producing a Reactor SCRAM.

As a result of the rapid closure of the Turbine Stop Valves and the Reactor SCRAM, the Reactor vessel water level experienced an initial "shrink" that caused the water level to reach the low level set point and initiate the Primary Containment Isolations (Groups 2, 3, and 5).

Earlier in the day the operators observed some irratic readings on the vibration recorder but attributed them to spurious signals.

At 1650 the SCRAM and Primary Containment Isolations were reset.

CAUSE OF EVENT

The immediate cause of the event was a malfunction of the No. 10 Bearing Vibration Probe (EIIS=VT) coil. The probe (EIIS=VT) coil produced an intermittent open and a short circuit which sent a false high vibration signal to the Turbine Supervisory Instrument System (JJ) and subsequently tripped the Main Turbine (TA) and caused a Reactor SCRAM.

The exact root cause as to the failure mechanism of the probe coil could not be readily determined but is suspected to be aging. The coil had been installed and was functional for approximately 16 years.

ANALYSIS OF EVENT

The events that occurred as a result of the turbine trip, Reactor SCRAM and Primary Containment Isolations did not have any safety implications to plant equipment or to the public.

The turbine trip, SCRAM and Primary Containment Isolations functioned as designed.

CORRECTIVE ACTIONS

The SCRAM and Primary Containment Isolations were reset.

The Instrument and Control Department investigated the false vibration signal and determined that the probe coil for No. 10 bearing had failed. The probe was subsequently replaced.

All remaining probes and their respective electronics were tested and no problems were identified.

As the probe failure is attributable to aging, the Instrument and Control Department will replace the remaining probes during the next refueling outage in 1989.

Additionally, the No. 10 bearing was physically inspected and no problems were found.

General Electric has provided us with new information regarding the interpretation of vibration readings that we will use for training the operators.

No further corrective actions are deemed necessary as a result of this event.

No similar events have been reported to the Commission in the last five years.

VERMONT YANKEE NUCLEAR POWER CORPORATION
P.O. BOX 157
GOVERNOR HUNT ROAD
VERNON, VERMONT 05354

July 19, 1988
VYV 88-154

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

REFERENCE: Operating License DPR-28
Docket No. 50-271
Reportable Occurrence No. LER 88-08

Dear Sirs:

As defined by 10CFR50.73, we are reporting the attached Reportable Occurrence as LER 88-08, Rev. 0.

Very truly yours,
VERMONT YANKEE NUCLEAR
POWER CORPORATION
/s/ for
James P. Pelletier
Plant Manager

cc: Regional Administrator
USNRC Office of Inspection and Enforcement
Region I
475 Allendale Road
King of Prussia, PA 19406

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